

Conservation biology meets medical science

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In 2017, Singer et al. (Singer et al. 2017) and Mendenhall (Mendenhall 2017) laid out that syndemics are a new path to global health research. Many medical researchers have since picked up on the topic, leading to the suggestion that the ongoing Covid-19 crisis is a syndemic and not a pandemic (Horton 2020). In a syndemic, the Covid-19 virus is not the primary cause of the current pandemic, but only a trigger due to the globally deteriorating human health (Horton 2020). Kenyon (Kenyon 2020) added that the syndemic approach needs to include an ecological dimension, while Mendenhall (Mendenhall 2020) stated that the context matters. None of the colleagues was wrong. However, it shows how little researchers from different disciplines interact and exchange on concepts. Syndemics is already well captured in the more medical-orientated OneHealth concept (Gibbs 2014), as well as in the more ecologically-orientated EcoHealth concept (Rapport 2007). All of these concepts and terms have in common to state that human health is inextricably linked to the environmental health and health-determining factors in the highly complex socio-ecological system. The complexity of this socio-ecological system, in which human health is embedded, is the underlying factor for the emergence of these slightly differently centred concepts, while the aim of all of these are the same: understanding the underlying causes for the increasing frequency of epidemics or pandemics (Schmeller et al. 2020). We know that intensifying pathogen emergence can be attributed to climate change, biodiversity loss, habitat degradation and an increasing rate of wildlife-human contacts, but that all of these are caused by synergies between persisting intense poverty and a growing human population (Schmeller et al. 2020).

To improve global management of the human-driven biological degradation and international dispersal processes that exacerbate those pandemic threats, we do not necessarily need new terms, but need to embrace the complexity of our life-support system and the human-driven change of it, as recently exemplified for biofilms (Sentenac et al. 2021). Hence, we do not need to do island research on the three processes driving emerging diseases: 1) understanding outbreaks and finding patient zero, 2) analyse dispersal processes of zoonotic pathogens and 3) assess the context of health issues caused by these zoonotic pathogens, but we need to conduct integrative research on all three processes together. Here, conservation biology meets medical science. The global scientific community needs to improve interactions and interdisciplinarity between the relevant discipline, including social, medical and environmental sciences. These interconnected conservation and health challenges need to be better promoted so that the scientific community can improve our understanding of the links between ecosystem, animal and human health.

References

- Gibbs EPJ (2014) The evolution of One Health: A decade of progress and challenges for the future. *The Veterinary Record* 174(4): 85–91. <https://doi.org/10.1136/vr.g143>
- Horton R (2020) Offline: COVID-19 is not a pandemic. *Lancet* 396(10255): e874. [https://doi.org/10.1016/S0140-6736\(20\)32000-6](https://doi.org/10.1016/S0140-6736(20)32000-6)
- Kenyon C (2020) Syndemic responses to COVID-19 should include an ecological dimension. *Lancet* 396(10264): 1730–1731. [https://doi.org/10.1016/S0140-6736\(20\)32219-4](https://doi.org/10.1016/S0140-6736(20)32219-4)
- Mendenhall E (2017) Syndemics: A new path for global health research. *Lancet* 389(10072): 889–891. [https://doi.org/10.1016/S0140-6736\(17\)30602-5](https://doi.org/10.1016/S0140-6736(17)30602-5)
- Mendenhall E (2020) The COVID-19 syndemic is not global: Context matters. *Lancet* 396(10264): e1731. [https://doi.org/10.1016/S0140-6736\(20\)32218-2](https://doi.org/10.1016/S0140-6736(20)32218-2)
- Rapport DJ (2007) Sustainability science: An ecohealth perspective. *Sustainability Science* 2(1): 77–84. <https://doi.org/10.1007/s11625-006-0016-3>
- Schmeller DS, Courchamp F, Killeen G (2020) Biodiversity loss, emerging pathogens and human health risks. *Biodiversity and Conservation* 29(11–12): 3095–3102. <https://doi.org/10.1007/s10531-020-02021-6>
- Sentenac H, Loyau A, Leflaive J, Schmeller DS (2021) The significance of biofilms to human, animal, plant and ecosystem health. *Functional Ecology*. <https://doi.org/10.1111/1365-2435.13947>
- Singer M, Bulled N, Ostrach B, Mendenhall E (2017) Syndemics and the biosocial conception of health. *Lancet* 389(10072): 941–950. [https://doi.org/10.1016/S0140-6736\(17\)30003-X](https://doi.org/10.1016/S0140-6736(17)30003-X)